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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,262	03/03/2005	Takashi Maeda	2005_0059A	8304
52349 7590 10/23/2007 WENDEROTH, LIND & PONACK L.L.P. 2033 K. STREET, NW SUITE 800 WASHINGTON, DC 20006			EXAMINER HESS, MICHAEL THOMAS	
			ART UNIT 3729	PAPER NUMBER
			MAIL DATE 10/23/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/523,262

Applicant(s)

MAEDA ET AL.

Examiner

Michael T. Hess

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 33 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

In Reference to Claim 33

The method according to claim 32, further comprising steps of:

after identifying the nozzle that has failed to pick up a component based on the obtained images shutting a vacuum air passage of that identified nozzle;

imaging the identified nozzle one more time, and detecting whether or not a component is still carried by the nozzle.

The first step of the method claimed in claim 33 above requires the identifying of the nozzle that has failed to pick up a component; however, the second step of the method claimed in claim 33 above requires the imaging of the nozzle one more time and detecting whether or not a component is *still* carried by the nozzle. Because the first step requires identifying a nozzle without a component it is unclear which nozzle applicant is discussing that is to be identified by an image for the purpose of detecting whether or not a component is still on the nozzle. Thus, there is a gap between

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necessary structural connections and the examiner cannot appropriately apply prior art to claim 33; and therefore, applicant should not view the lack of a prior art rejection with regards to claim 33 as an indication of allowable subject matter.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 30 rejected under 35 U.S.C. 102(b) as being anticipated by Scholten et al. (Scholten).

In Reference to Claim 30

Scholten teaches:

using nozzles (Ref. # 53), connected to a single vacuum generating device (Ref. # 109), to perform component (Ref. # 103) pick up operations (Col. 3, Lines 3-7) by picking up components (Ref. # 103) and perform component (Ref. # 103) mounting operations by mounting said components (Ref. # 103) onto said respective predetermined mounting positions (see Fig. 5);

preventing occurrence of a defective device due to a component failing to be mounted on said device (Col. 3, Lines 34-37), by

detecting (Col. 6, Lines 13-27, discussing using sonic detection to determine pressure in each pipette; it is known to use flow detection for determining pressure) vacuum pressure decrease of one of said nozzles (Ref. # 53) relative to a vacuum pressure to be achieved at a time of picking up a

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component by said one of said nozzles (Ref. # 53; Col. 9, Lines 52-59; it is inherent that the detected pressure will be compared to a predetermined value); making a judgment that said one of said nozzles (Ref. # 53) has lost the component (Ref. # 103) due to dropping of the component (Col. 10, Lines 8-11), if said vacuum pressure decrease of said one of said nozzles (Ref. # 53) exceeds a predetermined first threshold (Ref. # 53; Col. 9, Lines 52-59, the pressure will inherently be compared to some set threshold); and skipping the component mounting operation to be performed (Col. 10, Lines 15-18).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scholten in view of U.S. Patent No. 6,632,065 to Cameron et al. (Cameron).

In Reference to Claims 31 and 34

Scholten teaches:

detecting absolute value of the vacuum pressure achieved by the nozzle after completion of component pick up operation (Col. 9, Lines 52-54, a first pressure

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detection occurs immediately after picking up the component; see Col. 5, Lines 41-50, shows how the sensor works, see Col. 6, Lines 14-20, discussing the use air flow caused by the vacuum pressure (absolute value of the pressure measured by air flow)), and

if the detected absolute value of the achieved vacuum pressure is lower than a predetermined second threshold (Col. 9, Lines 54-59, detection of failure of component pick-up; see Col. 5, Lines 41-50, see Col. 6, Lines 14-27, discussing turbulence is the indication of whether component is picked up and receiving a positive or negative signal).

However, Scholten fails to teach:

having a close valve for each nozzle and shutting a vacuum air passage of the particular nozzle that fails to pick up a component.

Cameron teaches:

having a close valve for each nozzle and shutting a vacuum air passage of the particular nozzle that fails to pick up a component (Col. 6, Lines 25-28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added the close valves to each nozzle and closed the valve for a nozzle failing to pick a component as in Cameron to the method of Scholten in order to prevent vacuum leaks, in any pick and place process, as explicitly taught by Cameron.

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6. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scholten in view of Cameron as applied to Claim 31 and further in view of U.S. Patent No. 7,065,864 to Yamamoto et al. (Yamamoto).

In Reference to Claim 32

Scholten and Cameron teach:

The method according to Claim 31 (see 35 U.S.C. § 103 rejection of claim 31 above), further comprising steps of:

However, Scholten and Cameron fail to teach:

imaging each of the nozzles with a recognition camera; and
identifying which nozzle has failed to pick up a component based on the obtained images.

Yamamoto teaches:

imaging each of the nozzles with a recognition camera (Ref. # 207, Col. 14, Lines 21-24); and

identifying which nozzle has failed to pick up a component based on the obtained images (Col. 14, Lines 42-46) in order to visually determine which nozzle failed to pick up a component, so component mounting step can be skipped (Col. 14, Lines 42-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the steps of imaging the nozzles and determining which nozzle failed to pick up a component as taught by Yamamoto in the component pick up method taught by Scholten and Cameron in order to skip the component

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mounting step when a component has not been picked up as explicitly taught by Yamamoto.

7. Claim 35-39 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,683,654 to Scholten et al. (Scholten) in view of U.S. Patent No. 6,632,065 to Cameron et al. (Cameron).

In Reference to Claim 35-39

Scholten teaches:

Component mounting apparatus (see Fig. 1) comprising:

a vacuum generating source (Fig. 1, Ref. # 109);

a plurality of nozzles connected to said vacuum generating source (Col. 7, Lines 22-23, "thirty-two transfer arms..."),

a mounting head being supported in a movable manner and holding said plurality of nozzles (Ref. # 31, common carriage, which is slidable in the frame Ref. 23; Col. 7, Lines 26-28);

a component recognition device (Col. 1, Lines 49-54; Scholten states that it is known in the art to use optical detection methods in combination with pressure detectors to determine if pick up has properly occurred) positioned to face with the mounting head for recognizing components held by the nozzle;

a controller (Ref. # 127) for controlling operations of the component mounting apparatus in accordance with a method according to claims 30-34 (Cols. 9-10, Lines 59-5).

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Although Scholten only discloses the use of a recognition device in its background of invention section, it would have been obvious to one having ordinary skill in the art to include a camera as a failsafe check to determine if component pick up occurred.

However, Scholten fails to show:

a control valve for each nozzle capable of shutting a vacuum air passage;

Cameron teaches:

a control valve for each nozzle (Ref. # 144) capable of shutting a vacuum air passage (Col. 6, Lines 25-28, closure of a vacuum control valve) in order to prevent leaks (Col. 6, Line 33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the control valve for each nozzle of Cameron in the component mounting apparatus of Scholten in order to limit vacuum loss when not all nozzles complete component pick-up as explicitly taught by Cameron.

Response to Arguments

8. Applicant's arguments, see Remarks, filed August 16, 2007, with respect to Objections of the Drawings and Specification have been fully considered and are persuasive. The Objection of the Drawings and Specification of the Action dated April 16, 2007 have been withdrawn.

In Reference to Applicants' Argument Regarding 35 U.S.C. § 112 Rejection

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9. Applicants' arguments filed August 16, 2007 have been fully considered but they are not persuasive. Applicants state that the new claims have been drafted taking into account the 35 U.S.C. § 112, 2 rejection of Claim 4. However, Claim 33 which is analogous to old Claim 4 has not been changed to take into account the 35 U.S.C. § 112 rejection and there is no other argument regarding this rejection. Therefore, the 35 U.S.C. § 112, ¶ 2 rejection of Claim 4 in the Action dated April 16, 2007 is reestablished and applied to new Claim 33.

In Reference to Applicants' Argument Regarding Cameron et al.

10. Applicants' arguments with respect to the Cameron et al. in view of Jordan et al. rejection of claim 1 have been considered but are moot in view of the new ground(s) of rejection. Applicants argue that Cameron et al. fails to show mounting components on substrates. This argument is moot; however, Cameron is used in the Current rejection as analogous art to the pick and place art although it does not necessarily pickup components and place them on a substrate.

In Reference to Applicants' Argument regarding Scholten et al.

11. Applicants' arguments filed August 16, 2007 have been fully considered but they are not persuasive. Applicants argue that Scholten fails to show detecting a vacuum pressure to be achieved at a time of picking up a component and determining that component is missing if the vacuum pressure decrease of the nozzle exceeds a predetermined first threshold. Examiner has clarified the rejection of Claims 2-6 (now 31-34 and 39) using the Scholten et al. reference. The Scholten et al. reference discloses determining a pressure in the vortex chamber at a time of picking up the

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component through measuring sound changes and transfers this detection to an optical, acoustic or other perceptible indication. Further, Scholten discusses that the signals received can be processed to form a positive or negative indication (Col. 6, Lines 22-24) which would necessarily require comparing the pressure to a predetermined value, otherwise there would be no basis create a positive or negative indication. Therefore, Scholten as applied to Claims 2-6 in Action dated April 16, 2007 is now applied to Claims 30-39.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. Patent Nos. 5,768,765 to Fujioka et al and 6,094,808 to Mimura et al. are relevant prior art because they disclose methods substantially similar to Applicants' claimed invention; and
- U.S. Patent No. 6,260,259 to Kajii is relevant prior art because it discloses that a flow meter can be used to measure pressure.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael T. Hess whose telephone number is 571-270-1994. The examiner can normally be reached on 6:30 AM - 5:00 PM, Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MTH MTH 10.19.07



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